

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

OCCASIONAL PAPERS

OF THE

BERNICE PAUAAHI BISHOP MUSEUM OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY

VOL. VIII—No. 7

NEW OR LITTLE-KNOWN
HAWAIIAN FISHES

BY

HENRY W. FOWLER

HONOLULU, HAWAII
BISHOP MUSEUM PRESS
1923

OCCASIONAL PAPERS

OF THE

BERNICE PAUAAHI BISHOP MUSEUM OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY

VOL. VIII—No. 7

NEW OR LITTLE-KNOWN
HAWAIIAN FISHES

BY

HENRY W. FOWLER

HONOLULU, HAWAII
BISHOP MUSEUM PRESS
1923

HENRY W. FOWLER OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, WAS ELECTED A BISHOP MUSEUM FELLOW IN YALE UNIVERSITY FOR THE YEAR 1922-23. THROUGH THE COURTESY OF THE ACADEMY MR. FOWLER WAS ENABLED TO DEVOTE HIS ATTENTION TO THE STUDY AND IDENTIFICATION OF THE LARGE COLLECTION OF FISHES STORED IN THE BISHOP MUSEUM. ARRANGEMENTS BETWEEN THE ACADEMY OF NATURAL SCIENCES AND THE BISHOP MUSEUM PROVIDE FOR THE CONTINUATION OF ICTHYOLOGICAL STUDIES.

New or Little-Known Hawaiian Fishes

BY HENRY W. FOWLER.

While working over the fishes in the Bishop Museum, I have found a number of interesting new species and several species of signal rarity or not previously reported from Hawaii. This paper includes preliminary descriptions of the new species and a list of the names of those already described elsewhere. Unless otherwise stated, all the records pertain to Honolulu.

EULAMIIDAE

Eulamia munsing (Bleeker).

ECHINORHINIDAE

Echinorhinus brucus (Bonnaterre).

MOBULIDAE

Manta birostris (Walbaum).

CLUPEIDAE

Stolephorus delicatulus (Bennett).

GONORHYNCHIDAE

Gonorhynchus gonorynchus (Gmelin).

CONGRIDAE

Conger wilsoni (Schneider).

MURAENIDAE

Gymnothorax hepaticus (Rüppell).

Gymnothorax tile (Buchanan-Hamilton).

EXOEOETIDAE

Cypselurus spilopterus (Valenciennes).

CENTRISCIDAE

Centriscus strigatus (Günther).

SYNGNATHIDAE

Corythoichthys mataafae Jordan and Seale.

Two from Waikiki.

BERYCIDAE

Beryx decadactylus Cuvier.

ZEIIDAE

Zenopsis nebulosus (Schlegel).

SCOMBRIDAE

Thunnus thynnus (Linné).

Germo macropterus (Schlegel).

Nesogrammus thompsoni new species.

Head $3\frac{2}{3}$; depth $4\frac{2}{5}$; D. XI, III, 14-6; A. III, 11-5; P. 11, 13; V. I, 5; scales 168 from upper edge of gill-opening, in median lateral series, to caudal base; head width 2 in its length; mandible 2; snout $2\frac{3}{4}$; eye $5\frac{2}{3}$; maxillary $2\frac{1}{4}$; interorbital $3\frac{1}{8}$; third dorsal spine 11 $\frac{1}{4}$; first branched dorsal ray $2\frac{1}{3}$; first branched anal ray $2\frac{3}{5}$; least depth of caudal peduncle $7\frac{1}{2}$; greatest width of caudal peduncle $3\frac{1}{3}$; upper caudal lobe $1\frac{1}{3}$; pectoral $1\frac{5}{6}$; ventral $2\frac{1}{8}$.

Body elongately fusiform, moderately compressed, deepest midway in its length and profiles similarly and evenly curved. Caudal peduncle greatly depressed, forming broad adipose keel each side, which begins about opposite root of penultimate finlets. Small low oblique keel over base of each caudal lobe.

Head attenuated, compressed moderately and convex sides slightly more approximate below than evenly convex upper surface. Snout broadly conic, about wide as long. Eye moderate, high, hind pupil edge midway in head, without adipose eyelid. Mouth large, gape evenly curved and closed jaws even in front. Maxillary extends opposite first third in head, most of its upper edge slipping below narrow preorbital, and expansion half of eye. Teeth in jaws uniserial, lower larger and little wider spaced, and several larger teeth forward above each side. Transverse arc of small teeth on vomer uniserially. Row of small teeth along each palatine. Tongue broad, depressed, smooth, free all around front edge. Nostrils well separated, front one small pore eye-diameter before eye, and hind one oblique slit little nearer anterior than eye. Interorbital broadly and evenly convex. Preopercle entire, its contour evenly convex.

Gill-opening forward opposite posterior nostril. Gill-rakers as 0 to VII minute denticles, well spaced, but slightly protruding above finely asperous surface of cerato-branchial and gill-filaments $1\frac{1}{5}$ in eye. Pseudo-branchiae well developed, $\frac{2}{3}$ of gill-filaments. Isthmus long, slender and narrowly constricted to thin keel anteriorly.

Head with very finely imbedded scales, weak, mostly lateral and largely absent from muzzle and interorbital. Trunk covered with thin weak scales, each of larger ones more or less surrounded by smaller or minute ones, also surrounding and connecting thin membranes greatly porous, producing finely cavernous condition. Except spinous dorsal fins all with usual close-set transverse thin scales of closely fused scombroid squamation. Only one

lateral line completely developed, extends from above suprascapular region until opposite depressed pectoral end, then curving suddenly down as loop well behind pectoral tip, up again opposite vent, though obliquely toward last dorsal ray (really a finlet joined with dorsal) and angle or point of ascension at upper $2/5$ in body depth; then abruptly falls again to form ventral loop opposite last anal ray (really a finlet joined with anal), finally ascending and running close along upper surface of keel on caudal peduncle. An incomplete or accessory lateral line extends from upper part of gill-opening above and about far back as depressed pectoral tip, when obliterated. Scales cycloid, circuli moderate.

Dorsal spines low, rather slender, firm, fin entirely depressible in groove and its origin slightly behind that of pectoral. Soft dorsal with moderate anterior lobe which $3/5$ in depressed fin. Finlets all about uniform. Anal begins opposite penultimate dorsal ray basally, lower, otherwise like soft dorsal. Caudal widely forked, lobes alike, slender, pointed. Pectoral moderate, extends $2/3$ to soft dorsal origin. Ventral inserted slightly before pectoral origin, reaches $3\frac{1}{5}$ to anal. Vent close before anal.

Color when fresh deep neutral-dusky on back and upper surface, shading through neutral-gray on sides to pale gray on under surface of body. No sharp line of demarkation in color of back, though neutral gray of sides forms ragged margin along lower side of body. Each larger imbedded scale of body appears darker than surrounding membranes, thus producing finely and obscurely spotted appearance. Head largely neutral dusky, also iris. Fins all neutral dusky, at least lower ones terminally. Membrane of spinous dorsal black. Pectoral dusky, also dusky blotch at base, though not conspicuous and inside base jet-black.

The Museum has only the type, No. 3396, Bishop Museum, obtained in the market at Honolulu, December 28, 1922, by John W. Thompson, to whom I have dedicated the species. It is 965 mm. long and is related to *Nesogrammus piersoni* Evermann and Seale, from Sorsogon, Philippine Islands, known only from the type—an example but 16 inches long. *Nesogrammus thompsoni* differs in the presence of but a single developed lateral line. *Nesogrammus piersoni* is said to have two well developed lateral lines described with "the lower branch leaving the main lateral line under the base of third or fourth dorsal spine, from which point it extends nearly vertically downward to lower third of side, along which it runs, approximately parallel to the ventral line of body, to caudal peduncle." Further it is said to have "villiform teeth on vomer, palatines and tongue." The gill-rakers are described as "rather bluntly pointed, 15 on lower limb, the largest 3 in snout." The figure of *Nesogrammus piersoni* is shown with greatly higher

spinous dorsal, shorter pectoral and ventral and more finlets than the Hawaiian fish.

ISTIOPHORIDAE

Istiophorus orientalis (Schlegel).

Tetrapturus mitsukurii Jordan and Snyder.

CARANGIDAE

Caranx kuhlii (Bleeker).

Caranx lugubris Poey.

Decapterus sanctae-helenae Valenciennes.

Scyris indica Rüppell.

BRAMIDAE

Taractes steindachneri (Döderlein).

PSENIDAE

Nomeus gronovii Gmelin.

Several from Laie.

Cubiceps thompsoni new species.

Head $3\frac{1}{2}$; depth $3\frac{7}{8}$; D. X-1, 14; A. 11, 14; P. 11, 19; V. 1, 5; tubular scales 41 in lateral line, followed by 7 more non-tubular to caudal base, also with about 5 larger ones on latter 3 scales above lateral line to spinous dorsal origin, same to soft dorsal origin, 12 below to anal origin; 14 predorsal scales; head width 2 in its length; snout $3\frac{1}{10}$; eye $4\frac{1}{10}$; maxillary 4; interorbital $2\frac{3}{4}$; third dorsal spine $2\frac{1}{10}$; first branched dorsal ray (damaged) $4\frac{1}{3}$; first branched anal ray (damaged) $4\frac{1}{6}$; least depth of caudal peduncle 5; upper caudal lobe $1\frac{1}{6}$; pectoral $1\frac{3}{4}$; ventral $2\frac{1}{2}$.

Body elongately fusiform, well compressed, deepest at depressed tip of spinous dorsal or about midway in its length. Caudal peduncle well compressed, least depth $1\frac{1}{2}$ in its length.

Head well compressed, profiles convex with lower little more inclined, flattened sides slightly approximate below. Snout convex, with even swollen appearance, length $\frac{5}{6}$ its width. Eye moderate, without adipose-lid, $1\frac{1}{4}$ in snout and hind pupil edge midway in head length. Mouth small with very short gape, closed mandible slightly protruding. Maxillary largely concealed, extends $\frac{3}{5}$ in snout, expansion $2\frac{3}{4}$ in eye. Teeth minute, in narrow bands in jaws. No teeth on mouth roof or on broad depressed tongue, which rounded and free in front. Lips narrow, firm. Nostrils close together, each side of snout tip, front one simple pore and hind one vertical slit twice size of anterior. Preorbital width to maxillary groove, half of eye. Interorbital broadly and evenly convex. Preopercle edge entire.

Gill-opening forward opposite hind pupil edge. Gill-rakers 11 + 19, lanceolate, $2\frac{1}{5}$ in gill-filaments, which $1\frac{2}{5}$ in eye. Pseudobranchiae $1\frac{1}{2}$

in gill-filaments. Isthmus narrow, more slender forward, with right groove permitting gill-cover edge to fold within.

Scales thin, in even longitudinal rows, becoming smaller on back and belly medianly. Scales on head well covered over with adipose membrane. Soft dorsal and anal covered entirely with crowded and imbricated fine scales. Small scales on caudal base, also some small scales at pectoral base. Scales with 4 basal radiating striae, edge with 3 or 4 lobes and circuli very fine. Lateral line high, largely concurrent with dorsal profile, extends only to front of caudal peduncle above. Tubes well exposed, with many more or less fine parallel branches.

Spinous dorsal inserted about first fifth in pectoral, third spine longest, when depressed reaching beyond tips of last spines or $1\frac{3}{4}$ to soft dorsal. Latter inserted slightly nearer gill-opening than caudal base, with slight front lobe, rays all robust and connecting membranes rather low. Anal begins little behind soft dorsal origin, fin similar. Caudal strongly forked, long slender pointed lobes equal. Pectoral well inclined, reaches $2\frac{1}{5}$ to anal. Ventral origin slightly behind that of pectoral, reaches $1\frac{1}{3}$ to anal. Vent close before anal.

Color in alcohol pale olive-brown above, each scale edge with slaty tinge and lower surface of body but slightly paler. Head uniform brownish. Iris dull slaty. Spinous dorsal dusky, other fins more or less dull brown.

Type, No. 3403, Bishop Museum, 635 mm. long. Obtained by John W. Thompson in the market at Honolulu. It resembles *Cubiceps gracilis* (Lowe), from the Atlantic, but that species has fine scales.

SERRANIDAE

***Epinephelus septemfasciatus* (Thunberg).**

***Caesioerca thompsoni* new species.**

Head $3\frac{1}{2}$; depth $2\frac{2}{5}$; D. X, 16, 1; A. III, 7, 1; P. II, 20; V. I, 5; scales 58 in lateral line to caudal base and several more non-tubular on latter; 7 scales above lateral line to spinous dorsal origin, 6 above to soft dorsal origin, 19 below to anal origin; 35 predorsal scales; head width $1\frac{3}{4}$ in its length; mandible 2; third dorsal spine $2\frac{1}{2}$; twelfth dorsal ray $1\frac{1}{4}$; third anal spine $2\frac{7}{8}$; least depth of caudal peduncle $1\frac{7}{8}$; pectoral 1; ventral $1\frac{1}{10}$; snout $4\frac{2}{5}$ in head measured from upper jaw tip; eye 4; maxillary $2\frac{1}{10}$; interorbital 3.

Body elongately ellipsoid, deepest near end of depressed pectoral, and predorsal compressed to keel. Caudal peduncle strongly compressed, length slightly less than its least depth.

Head small, well compressed, profiles alike, flattened sides slightly approximated below. Snout obtuse, convex, length $\frac{3}{4}$ its width. Eye small, lateral, hind edge slightly before center in head length. Maxillary very oblique, reaches opposite front pupil edge and expansion $1\frac{1}{4}$ in eye.

Mandible strong, shallow forward, rami well elevated inside mouth. Teeth in jaws simple, conic, uniserial. Pair of strong upper canines and 2 each side, close together, flare out near symphysis of mandible, and together with upper canines visible when mouth closes. Upper jaw also with pair of approximated inner canines. Along each mandibular ramus anteriorly are strong curved canines. Small patch of small, simple, conic teeth on vomer and on each palatine. Apparently no teeth on ectopterygoids and none on tongue, which is free in front. Nostrils close before eye, front one a small simple pore with very slight cutaneous rim and hind one a short vertical slit close before eye. Interorbital convexly elevated. Hind preopercle edge and angle finely denticulated. No preopercular spine.

Gill-opening extends forward opposite front eye edge. Gill-rakers $11 + 27$, lanceolate, slender, equal gill-filaments or $11\frac{1}{2}$ in eye. Pseudo-branchiae $11\frac{1}{2}$ in gill-filaments. Isthmus narrowly constricted.

Each scale with auxiliary basal small one. Cheek with 12 rows of scales, exclusive of basal auxiliaries. Maxillary with 7 rows of scales across its expansion. Suprascapula entire. Small scales form restricted basal border to spinous dorsal, soft dorsal and anals, and extend over caudal base. Lateral line strongly arched, though its course is nearly concurrent with dorsal profile. Tubes all simple, anterior only half over each scale exposure and posterior entirely over scale exposure.

Dorsal spines slender, fin edge but slightly notched, first shortest and—after third and fourth, which are longest—nearly subequal. Soft dorsal more or less uniformly high to twelfth or thirteenth rays, which form little filament extending posteriorly nearly opposite middle of median caudal rays. Third anal spine longest, second sub-equal, and median soft rays form point extending opposite caudal base. Caudal elongate, strongly forked, with long slender lobes, each ending in filament and upper slightly longer, which $1\frac{3}{4}$ in rest of fish. Median pectoral rays longest, fin $1\frac{1}{4}$ to anal. Ventral not quite reaching vent or $\frac{4}{5}$ to anal, spine $1\frac{2}{3}$ in fin.

Color in alcohol faded rosy-pink, now pale and more or less uniform. Fins yellowish.

Type, No. 3376, Bishop Museum, from Honolulu. Obtained February 11, 1922, by John W. Thompson. It is 200 mm. long. *Caesioperca* is represented previously only in the Austro-Pacific by *Caesioperca rasor* (Richardson) and *Caesioperca lepidoptera* (Schneider). Both differ from *Caesioperca thompsoni* in color and the presence of more fin rays.

Caprodon longimanus (Günther).

Odontanthias elizabethae new species.

Head $2\frac{4}{5}$; depth $2\frac{1}{3}$; D. X, 14, 1; A. III, 7, 1; P. II, 16; V. I, 5; scales 37 in lateral line to caudal base and 3 more on latter; 8 scales above lateral line to spinous dorsal origin, 2 above to base of sixth dorsal spine,

16 below to origin of spinous anal; predorsal scales 38; head width $2\frac{1}{10}$ in its length; mandible 2; third dorsal spine $2\frac{2}{5}$; third anal spine $2\frac{1}{4}$; least depth of caudal peduncle $2\frac{3}{4}$; pectoral $1\frac{1}{6}$; ventral spine $1\frac{7}{8}$; snout $3\frac{7}{8}$ in head measured from upper jaw tip; eye $3\frac{3}{4}$; maxillary $2\frac{1}{10}$; interorbital $3\frac{2}{5}$.

Body elongately ovoid, deepest at hind edge of gill-opening and predorsal with scarcely developed median ridge. Caudal peduncle strongly compressed, length $\frac{3}{4}$ its least depth.

Head moderate, well compressed, profiles alike, flattened sides evenly approximated above and below. Snout short, convex over surface, length $\frac{3}{4}$ its width. Eye large, lateral, hind pupil edge about midway in head length. Maxillary very oblique, reaches front pupil edge, and expansion $1\frac{3}{5}$ in eye. Mandible strong, protrudes, rami well elevated inside mouth posteriorly. Teeth fine, in bands in jaws, broad patch on vomer, equally broad patch on each palatine and smaller patch behind on ectopterygoid. Pair of upper outer canines, inner upper pair closer. Two close-set lower canines flaring slightly outward, when jaw closes fitting close inside upper outer pair. Two strong curved canines anteriorly, close-set, on each ramus of mandible. Outer lower teeth, especially where extending along side of maxillary, slightly enlarged. Nostrils together, close before eye, anterior with rather short cutaneous edge, posterior larger pore close to upper front eye edge. Interorbital convexly elevated. Hind preopercle edge denticulate, few larger serrae along lower edge and broadly triangular preopercle spine about half length of pupil.

Gill-opening forward opposite hind nostril. Gill-rakers $14+30$, lanceolate, slender, $1\frac{1}{3}$ in eye, and gill-filaments about $\frac{2}{5}$ of longest gill-rakers. Pseudobranchiae slightly larger than gill-filaments. Isthmus narrowly constricted.

Scales crowded on head above, and 12 rows across cheek. Maxillary with 8 rows of scales transversely. Suprascapula with about 5 denticles. Opercular spines 4. Bases of dorsals, anals and caudal finely scaly. Lateral line strongly arched, forms angle just before caudal peduncle, then straight to middle of caudal base. Tubes in lateral line simple, well developed, each extending over scale exposure to its hind edge.

Color in alcohol faded dull brown, with ruddy tint. Broad white band encircles caudal peduncle, crosses lateral line at least 4 or 5 scales in width. Fins all pale.

Type, No. 3404, Bishop Museum, 217 mm. long, was obtained at Honolulu by John W. Thompson. It differs from the other species in the genus in its striking coloration. *Anthias rhodopeplus* Günther is figured with a yellowish streak from below the eye to the side of the breast, and another along the back embracing the caudal peduncle, but the latter with a purplish blotch above posteriorly. *Anthias chrysostictus* Günther is more closely allied in

profile, but has the yellow band from the eye extending to pectoral base and body more uniform red. Named for my wife, Elizabeth K. Fowler, in slight tribute for her assistance during my work on Hawaiian fishes.

STEREOLEPOIDES new genus.

Type *Stereolepoides thompsoni* new species

This nominal genus is established for the large Hawaiian jewfish, with a very narrow preorbital and therefore greatly diverse profile from *Stereolepis* Ayres. With the latter it is allied in the dentition, especially the absence of canines, the small eye, the head not rugose and the presence of a supplemental maxillary. (*Stereolepis*, the California jewfish, and *ethas* appearance.)

Stereolepoides thompsoni new species.

Snout 4 in head, measured from upper jaw tip; eye 12; maxillary 1 1/2; interorbital 4 1/5. Maxillary width 1 3/4 in snout. Mandible strongly protrudes. Bands of fine simple conic teeth in jaws, in 8 to 10 irregular rows along side of lower jaw, which extend back well toward rictus. Bands of teeth in upper jaw little broader than lower bands. Patch of similar teeth on vomer and palatines. No canines. Nostrils close together and close before eye, similar in size. Hind preopercle edge finely serrate, with about 8 slightly enlarged denticles about angle. Three obscure opercular spines, all in about same vertical plane. Gill-rakers 1x + xx, very short and tuberculate, greatly shorter than filaments. Scales on head cycloid, none on snout, maxillary, mandible or preorbital.

Type, No. 3406, Bishop Museum, a head 584 mm. long, from a large example obtained in Honolulu, by John W. Thompson. He estimates this fish between six and seven feet in length. He says its soft dorsal, anal and caudal were spotted with black.

PRIACANTHIDAE

Priacanthus boops (Schneider).

LUTJANIDAE

Aphareus thompsoni new species.

Head 3 1/8; depth 3 2/3; D. X, 11, 1; A. III, 8, 1; P. 11, 5; V. I, 5; scales 73 in lateral line to caudal base and 3 more on latter; 8 scales above lateral line to spinous dorsal origin, 17 below to spinous anal origin; 23

predorsal scales; head width $2\frac{1}{4}$ in its length; mandible $1\frac{2}{3}$; third dorsal spine $2\frac{2}{3}$; third dorsal ray $4\frac{1}{3}$; last dorsal ray $1\frac{5}{6}$; third anal spine $3\frac{2}{3}$; first anal ray $3\frac{7}{8}$; last anal ray 2; least depth of caudal peduncle $4\frac{1}{8}$; lower caudal lobe (tip broken) $1\frac{1}{5}$?; pectoral $1\frac{1}{10}$; ventral $1\frac{1}{2}$; snout 3 in head measured from upper jaw tip; eye $4\frac{1}{2}$; maxillary $1\frac{7}{8}$; interorbital $3\frac{2}{5}$.

Body elongately ovoid, strongly compressed, deepest at middle of depressed pectoral, slight median predorsal ridge, other edges convex. Caudal peduncle compressed, least depth $2\frac{2}{3}$ in its length.

Head attenuated, compressed, flattened sides approximating below, and profiles alike. Snout conic, width but slightly less than its length. Eye moderate, high, hind pupil edge midway in head length, $1\frac{2}{5}$ in snout. Mouth moderate, well inclined, gape straight. Mandible well protruded. Maxillary slips below rather narrow preorbital most its length, reaches opposite hind pupil edge and expansion 2 in eye. Bands of villiform teeth in jaws. Vomer, palatines and tongue toothless, latter depressed, free and rounded in front. Nostrils together, small, slightly before last fourth in head. Interorbital convex. Preopercle entire.

Gill-opening forward opposite first third in snout. Gill-rakers slender, lanceolate, $18+34$, longest $1\frac{1}{10}$ in eye. Gill-filaments $1\frac{2}{3}$ in gill-rakers. Pseudobranchiae nearly long as gill-filaments. Isthmus narrowly compressed to long trenchant keel forward, with short pit or groove in front.

Scales in even longitudinal series, parallel with lateral line both above and below. Scales with 10 or 11 basal radiating striae and weak apical denticles 108 with about 15 transverse basal elements. Nine rows of scales across cheek to preopercle ridge. Muzzle, including maxillary, naked. Broad naked preopercle flange with fine radiating striae. Small scales on pectoral and ventral bases, more so on caudal base. Lateral line largely concurrent with dorsal profile of back, simple tubes each extending about half of scale exposure.

Spinous dorsal origin close behind that of ventral, spines slender, third longest and fin edge entire. Soft dorsal origin about midway between caudal base and hind edge of gill-opening, rays gradually shorter to last, which extends back to caudal base. Spinous anal inserted opposite soft dorsal origin, third spine longest and soft fin like soft dorsal. Caudal strongly forked, slender lobes pointed (damaged), apparently equal. Pectoral long, slender, pointed, reaches back opposite vent, which $\frac{7}{8}$ of eye-diameter before anal. Ventral inserted close behind pectoral base, fin reaches $1\frac{2}{3}$ to anal, spine $2\frac{1}{4}$ in head.

Color in alcohol faded uniform or dull brown, but slightly paler below. Iris pale slaty.

Type, No. 3397, Bishop Museum. Obtained by Mr. John W. Thompson in the market at Honolulu. It measures 451 mm. Representing a new species, distinguished by the greatly increased gill-rakers, nearly twice as many as in *Aphareus furcatus*. The

long falcate pectorals and pale coloration are other characters of distinction. Compared with four examples of *Aphareus furcatus* I find that species to have the gill-rakers but 11 to v, 4 to 6 + 16 to 18.

MULLIDAE

Upeneus barberinus (Lacépède).

PSEUDOCROMIDAE

Pseudochromis polyacanthus Bleeker.

LABRIDAE

Lepidaplois modestus (Garrett).

Coris variegata (Rüppell).

Julis greenovii Bennett.

CALLYDONTIDAE

Scaridea balia Jenkins.

Callyodon troscheli (Bleeker).

Callyodon xanthopleura (Bleeker).

HISTIOPTERIDAE

Histiopterus typus Schlegel.

One from Hilo.

CHAETODONTIDAE

Chaetodon collaris Bloch.

Hemitaurichthys polylepis (Bleeker).

Hemitaurichthys thompsoni new species.

Head $3\frac{1}{3}$; depth $1\frac{3}{4}$; D. XII, 26; A. III, 21; P. 11, 17; V. I, 5; scales 81 close above and along lateral line to caudal base, and about 15 more out on latter; tubular scales in lateral line 79 to caudal base; 18 scales above lateral line to base of first dorsal spine, 7 above to base of first dorsal ray, 40 below to spinous anal origin; about 60 predorsal scales; head width $2\frac{1}{3}$ in its length; mandible 2; sixth dorsal spine $2\frac{1}{3}$; seventh dorsal ray $1\frac{3}{5}$; third anal spine $1\frac{9}{10}$; third anal ray $1\frac{1}{3}$; least depth of caudal peduncle $2\frac{7}{8}$; caudal (tips damaged) 1; pectoral 1; ventral 1; snout $2\frac{2}{3}$ in head measured from upper jaw tip; eye $3\frac{1}{4}$; maxillary $4\frac{1}{6}$; interorbital $3\frac{1}{3}$.

Body deeply ovoid, strongly compressed, greatest depth at tip of depressed ventral spine. Caudal peduncle small, well compressed, length $\frac{3}{5}$ in its least depth.

Head strongly compressed, flattened sides moderately constricted below, upper profile well curved concavely to occiput, then slightly convex to spinous dorsal, and lower profile concave, though more inclined. Snout conic, compressed, width $1\frac{2}{5}$ in its length. Eye large, well elevated, center midway in head. Mouth small, terminal, jaws greatly protractile, though even when closed. Maxillary slips largely below preorbital, reaches half way in snout and expansion $3\frac{1}{4}$ in eye. Teeth fine, simple, conic, in narrow bands in each jaw. Nostrils close together, front one at last fourth in snout and hind one slightly elevated close along front edge. Both nostrils simple pores of moderate size. Interorbital convex. Preorbital width $1\frac{2}{5}$ in eye. Preopercle entire.

Gill-openings forward opposite front pupil edge. Gill-rakers $6+12$, short weak points $\frac{1}{6}$ of gill-filaments which $1\frac{3}{5}$ in eye. Pseudobranchiae long as gill-filaments. Isthmus narrowly constricted, rounded convexly over surface.

Scales finely ctenoid, above lateral line in even longitudinal series parallel with its course anteriorly, after arch horizontal or but little inclined upward. Scales below lateral line in even longitudinal series. Scales smaller along edges of body, largely over vertical fins and upper surface of head. From lower eye edge 9 rows of scales across cheek to preopercle keel and 4 more across preopercle flange. Head scaly except small area around nostrils, front of snout, muzzle and lower face of mandible. Scales with 7 or 8 basal radiating striae, apical denticles 47 to 52 and basal elements in 3 series, circuli moderate. Suprascapula ends in 6 small denticles. Lateral line arched, largely concurrent with dorsal profile, at least squamous area on dorsal fins, falls behind until level with upper third of caudal peduncle to caudal base. Tubes in lateral line small, simple, well exposed.

Spinous dorsal origin above gill-opening, spines graduated up to sixth, which longest, afterwards subequal (eighth and ninth abnormally short). Soft dorsal rounded, origin slightly nearer caudal base than pectoral origin, median rays longest. Spinous anal origin opposite base of eleventh dorsal spine, spines graduated to third, which longest. Soft anal like soft dorsal, rounded, though front rays little highest. Caudal broadly triangular, hind edge concave. Pectoral reaches opposite base of third anal spine, upper rays longest. Ventral origin opposite that of pectoral, fin reaching base of second anal ray, spine $1\frac{4}{5}$ in head. Vent half an eye-diameter before anal origin.

Color when fresh deep uniform neutral dusky, especially on outer portions of vertical fins. Ventrals largely blackish. Pectoral pale dusky. Sides of chest with deep bluish reflections. Jaws dusky. Iris blackish.

Type, No. 3390, Bishop Museum, secured November 12, 1922, by John W. Thompson in Honolulu. Length 168 mm. It is another interesting addition of the genus *Hemitaurichthys*, differing at once from the *Hemitaurichthys polylepis* in its uniform dark color, increased soft rays in both dorsal and anal, entire preopercle and much smaller scales.

Holacanthus arcuatus Gray.

Holacanthus flavissimus Cuvier.

ACANTHURIDAE

Hepatus nigricans (Linné).

Hepatus thompsoni new species.

Head $3\frac{7}{8}$; depth 2; D. IX, 24, 1; A. III, 24, 1; P. II, 14; V. I, 5; scales about 142 counted along close above lateral line to caudal base; 16 scales above lateral line to soft dorsal origin, 60 below to spinous anal origin; head width $1\frac{4}{5}$ in its length; ninth dorsal spine $1\frac{7}{8}$; ninth dorsal ray $1\frac{2}{5}$; third anal spine $3\frac{1}{3}$; sixteenth anal ray $1\frac{1}{3}$; least depth of caudal peduncle $2\frac{1}{3}$; ventral $1\frac{1}{10}$; snout 2; eye $3\frac{4}{5}$; maxillary $4\frac{1}{3}$; interorbital $2\frac{2}{3}$; caudal $2\frac{1}{2}$ in combined head and trunk; pectoral $3\frac{1}{8}$.

Body strongly compressed, contour rather evenly ovoid, deepest at anal origin, predorsal trenchant and breast convexly rounded. Caudal peduncle strongly compressed, length $\frac{3}{4}$ its least depth.

Head rather small, lower profile slightly more convex, flattened sides but slightly approximate below. Snout compressed, profile slightly convex, width $1\frac{1}{4}$ its length. Eye elevated, front pupil edge midway in head length, $1\frac{2}{3}$ in snout. Maxillary concealed by broad preorbital. Mouth with short gape, about $\frac{2}{3}$ its width. Teeth compressed, uniserial, each edge moderately crenulated. Nostrils together, close before eye, front one pore with slight cutaneous rim about last fourth in snout length and hind one short horizontal slit midway between front one and eye. Interorbital convexly elevated, giving place to median trenchant keel extending to spinous dorsal. Preopercle edge entire, inclined forward until angle falls opposite front pupil edge. Preopercle flange, opercle and exposed shoulder, girdle with rather coarse striae.

Gill-opening forward opposite front eye edge. Gill-rakers 5+10 short points, about $\frac{1}{5}$ of gill-filaments, which are as long as eye. Pseudobranchiae $\frac{3}{4}$ of gill-filaments. Isthmus moderately constricted, produced into broadly convex lower edge, its width but slightly greater than eye.

Scales small, all closely and firmly adherent, finely ctenoid on trunk, cycloid on head. All fins covered with fine scales basally, less on pectorals than on others. Scales with 17 to 26 apical denticles, transversely about 9 series and circuli fine. Lateral line complete, tubes very distinct and pores very small.

Spinous dorsal origin opposite upper hind edge of gill-opening, spines firm, graduated up to last, which longest. Soft dorsal origin midway between front nostril and caudal base, last rays of fin ending in point. Origin of spinous anal midway between snout tip and base of last anal ray, spines graduated up to third which longest, though shorter than first ray. Soft anal like soft dorsal. Caudal widely lunate, ending in long slender points, upper slightly longer. Lance slender, long as eye. Pectoral with upper rays longest, pointed, reaches base of third anal ray. Ventral inserted

close behind pectoral base, depressed fin reaching base of first anal ray and spine $1\frac{2}{3}$ in head, it reaching origin of spinous anal.

Color when fresh dark neutral dusky, uniform and all vertical fins more or less blackish. Pectoral with dusky olive tinge and within basal portion of its axil jet-black blotch, less than eye, extending slightly below lowest rays. No white or pale edge on any of the fins. Iris dusky. Lips black. Teeth white.

Type No. 3394, Bishop Museum, obtained at Honolulu, December 10, 1922, by John W. Thompson. Length 223 mm. Unique among Hawaiian tangs in its nearly uniform dark or blackish color, with a black blotch extending a little from below axil of pectoral fin. It closely suggests *Acanthurus mata* Valenciennes, as figured and described by Day from Madras. That fish does not have the black blotch extending from the axil of the pectoral below the base of the fin.

BALISTIDAE

Balistes fuscus Schneider.

Canthidermis maculatus (Bloch).

Canthidermis rotundatus (Proce).

OSTRACIIDAE

Ostracion cubicus Linné.

TETRODONTIDAE

Liosaccus cutaneus (Günther).

Canthigaster margaritatus (Rüppell).

MOLIDAE

Masturus lanceolatus (Liénard).

SCORPAENIDAE

Taenianotus triacanthus Lacépède.

Iracundus signifer Jordan and Evermann.

ECHENEIDIDAE

Remoropsis brachyptera (Lowe).

PLEURONECTIDAE

Platophrys thompsoni new species.

Head $3\frac{1}{2}$; depth $1\frac{2}{3}$; D. 86; A. 62; P. 11; V. 6; scales 132 counted close along lateral line to caudal base; tubes in lateral line 92 to caudal base and 3 more on latter; 34 scales above arch of lateral line to profile of back; 55 scales below, near beginning of lateral line, to ventral edge; width of head $3\frac{2}{5}$ in its length; height of dorsal at greatest body width $2\frac{2}{5}$; height of anal opposite middle in straight section of lateral line $2\frac{1}{3}$; least depth of caudal peduncle $2\frac{3}{5}$; caudal $1\frac{1}{6}$; pectoral $1\frac{2}{5}$; ventral length $1\frac{3}{5}$; snout $4\frac{1}{3}$; eye $3\frac{1}{4}$; maxillary 3; interorbital $1\frac{7}{8}$.

Contour of body deeply ovoid, deepest at beginning of straight section of lateral line. Caudal peduncle greatly restricted, strongly compressed.

Head very deep, upper profile steeply arched. Snout short, about $\frac{3}{4}$ of eye. Eyes greatly separated, posterior beginning directly behind anterior, equal in size or half of interorbital. Mouth small, curved little from vertical downward with gape nearly reaching eye, jaws even. Maxillary narrow, expansion $3\frac{1}{4}$ in eye. Bands of moderate simple conic teeth along each jaw edge, upper extending along premaxillary to its hind end. Teeth of left side exposed when mouth closes, on right side concealed by rather narrow lips. Nostrils close together, each with rather low cutaneous border and both placed close before lower eye level with front of supraorbital ridge. Latter has several bony jagged points or irregular denticles at same point, depression separating it from upper front bony ridge of lower eye which has a similarly jagged edge. Bony jagged point near side of snout tip. Upper eye with antero-orbital bony keel and both anterior lower and superior upper with keel or ridge, these smoother. Interorbital concave, broadly depressed medianly. Preopercle edge entire.

Gill-opening extends forward about opposite hind pupil edge of lower eye. Gill-rakers v, I + II, III, lanceolate, half of gill-filaments, which $2\frac{1}{3}$ in eye. Pseudobranchiae long as gill-filaments. Isthmus long, slender, compressed keel or prow, extended under gill-covers opposite front edge of eye.

Scales very fine and uniform over most of body, ctenoid on cheeks and both postoculars on left side, besides about bases of dorsal and anal. Rest of left side with nearly smooth scales like all on right side, membranes of fin rays all finely scaled. Postorbital scales with 35 to 42 waved radiating striae, apical denticles 16 or 17 rather large and 1 or 2 auxiliary very short basal series. Body scales similar, without denticles. Lateral line with strong though rather short anterior arch, its length $5\frac{2}{5}$ in straight section. Tubes simple, large and well exposed.

Dorsal begins on snout $\frac{2}{3}$ an eye-diameter from snout tip, front rays with only tips slightly free and other rays evenly connected. Front median dorsal rays longest. Anal begins little before pectoral origin and hind median rays longest. Caudal convexly rounded behind, median rays longest. Pectoral small, oblique, reaches about first fourth in lateral line. Ventral with broad base, $1\frac{1}{3}$ in interorbital.

Color in alcohol dull brown on left side, with grayish sepia tint, very finely mottled or marbled with brownish. Many dark brown specks, ver-

miculations and bars sprinkled about, these most distinct and definite, dark or dusky, along upper front keel of head and about front of each eye. On interorbital they gradually become fewer. Three clusters of dusky spots along straight section of lateral line. Vertical fins mottled with pale dusky spots, variable, though along dorsal and anal seven or more rather distinct dark spots along each fin sub-basally, each separated by 7 or 8 rays. Right side of body pale or uniform whitish, only terminal dark spots of vertical fins showing through as grayish or dusky-gray.

Type, No. 3398, Bishop Museum, 134 mm. Obtained by John W. Thompson at Honolulu. Among the Hawaiian species of *Platophrys* the present is most closely related to *Platophrys mancus* in its widespread eyes with a broad interorbital space. Upon comparison with a series of *Platophrys mancus* of similar size, the squamation is seen to be very similar, the fin rays much fewer in number, and the upper frontal profile so different, that the much wider interorbital renders the upper eye at an oblique angle in the opposite direction or sloping from left to right downward. I have seen no examples of *Platophrys mancus* with so few rays in the anal fin. On the contrary I have seen no example of *Platophrys mancus* with the largely cycloid scales of the left side nor are they ever so minute. In a Palmyra example at hand, all are ctenoid on the left side.

CALLIONYMIDAE

Calliurichthys decoratus Gilbert.

GOBIIDAE

Chlamydes laticeps Jenkins.

Laie, Oahu.

Gobiopterus farcimen Jordan and Evermann.

BLENNIIDAE

Cirripectes alboapicalis (Ogilby).

Salarias meleagris Valenciennes.

Mokuauia Island, Laie Bay, Oahu.

Enchelyurus edmondsoni new species.

Head 4; depth $4\frac{5}{6}$; D. 32; A. 20; P. 15; V. 2; head width $1\frac{1}{2}$ in its length; snout $4\frac{1}{8}$; eye $3\frac{1}{5}$; mouth width 4; first dorsal spine $2\frac{2}{5}$;

twentieth dorsal ray $1\frac{1}{3}$; tenth anal ray 2; least depth of caudal peduncle 3; caudal $1\frac{1}{4}$; pectoral $1\frac{1}{5}$; ventral slightly greater than head.

Body moderately long, deepest about middle of pectoral, well compressed. Caudal peduncle not free, well compressed.

Head moderate, surface convex, little swollen below to slightly constricted above. Snout very obtusely convex in front, length half its width. Eye large, hind edge at first $\frac{2}{5}$ in head, its diameter twice snout in profile. Mouth broad, inferiorly transverse, gape not quite extending back opposite front edge of eye. Teeth fine, even, in single row in each jaw. Maxillary reaches back opposite front edge of pupil. Lips thin, even, entire. No orbital or nasal tentacles. Interorbital moderately convex, wide as eye.

Gill-opening vertical lateral slit, about equals eye. Skin entirely smooth. Lateral line not evident.

Dorsal origin over last fifth in length of head, flexible spines hardly distinguishable from soft rays, without notch and fin united broadly with caudal. Anal begins midway between front edge of eye and caudal base, edge of fin slightly notched on each membrane all along, united with caudal. Caudal with median rays longest, rounded behind. Pectoral broadly rounded, reaches $\frac{4}{5}$ to vent. Ventral jugular, inner ray longer and reaches vent, which close before anal.

Color in alcohol dusky-brown, or general color uniform. Side of head with four or five dusky streaks inclined forward, below six more inclined backward. Black blotch at front of dorsal and rest of fin with many black lines, parallel and inclined up posteriorly. Caudal uniform. Anal with three longitudinal rather broad dusky bands its whole extent. Pectoral and ventral uniformly pale. Iris slaty.

No. 3401, Bishop Museum. Type. Honomuni, Molokai. July, 1914. W. A. Bryan. Length 34 mm.

Differs from *Enchelyurus ater* (Günther) in its variegated color-pattern. *Enchelyurus ater* is uniform blackish-brown. Named for Charles H. Edmondson in appreciation of his work on Hawaiian crustacea.

CARAPIDAE

Fierasfer homei (Richardson).

Jordanicus gracilis (Bleeker).

Kahola, Oahu.

TRICHONOTIDAE

CRYSTALLODYTES new genus.

Type *Crystallodytes cookei* new species.

Body greatly elongate, partly cylindrical. Head conic, attenuate. Snout produced, with broad premaxillaries. Eyes high, very small. Mouth inferior, with rather long gape. Lower teeth better developed than upper, and none on palate. Interorbital very narrow, shallow. No gill-rakers. Pseudobranchiae well developed. No scales. Lateral line complete, with well developed pores. Dorsal and anal without spines, rays all simple, flexible, begin well behind pectoral, free from caudal, in moderate number. Caudal rounded. Pectoral and ventral well developed. Coloration pellucid. (Κρ'σταλλος, crystal; δ'α, to dive.)

Minute fishes of tropical sandy shores. The genus differs from *Trichonotus* from the East Indies in the absence of teeth on the palate, the absence of scales and the protruding upper jaw, minute eyes and enlarged teeth of the lower jaw. With the exception of the protruding upper jaw it likewise differs from *Hemerocoetes* from New Zealand.

Crystallodytes cookei new species.

Head 5; depth 9; D. 36; A. 36; P. 10; V. 1, 5; head width 2 in its length (now abnormally expanded much wider); snout $3\frac{3}{4}$; orbital socket $6\frac{1}{2}$; maxillary 2; pectoral $1\frac{3}{4}$; ventral $2\frac{1}{8}$; least depth of caudal peduncle 4; caudal $1\frac{7}{8}$.

Body very slender, terete, subcylindrical anteriorly, becoming compressed posteriorly, deepest at pectoral origin and edges all evenly convex. Caudal peduncle slender, compressed, about long as deep.

Head pointed, conic, apparently normally deep as wide. Eye very small, about $\frac{1}{3}$ of orbital socket, supra-lateral, directed largely forward, impinging on upper profile. Hind edge of orbital socket about half an eye-diameter before center in length of head. Maxillary slender, reaches half an orbital diameter beyond orbit. Minute teeth in row on maxillary and larger ones well spaced, in row along each mandibular ramus, also inner irregular row of very small low teeth. Premaxillaries anteriorly very broad, length not quite half of snout length. Interorbital little less than orbit, concave. Cranium rather evenly convex. Each nostril in short tube close to end of snout before premaxillary bases. Opercle with numerous or rather close-set radiating striae.

Gill-opening extends forward opposite hind orbital edge. Gill-filaments short, barely half of eye. Pseudobranchiae long as gill-filaments. Isthmus narrowly constricted, long, more slender forward and gill-membranes not united or forming fold across.

Body smooth, naked. Lateral line median from shoulder to caudal base, with 55 pores to latter.

Dorsal origin begins at first $\frac{2}{5}$ in combined head and trunk length, fin uniformly high most its course, or $\frac{3}{5}$ of body depth, and only last rays gradually shorter. Anal like dorsal, begins slightly behind base of second

dorsal ray. Caudal moderate, median rays longest, hind edge rounded. Pectoral with upper rays longest, reaches $3/5$ to dorsal. Ventral inserted immediately before pectoral base, depressed $2/5$ to anal.

Color in life transparent or nearly glassy. Iris silvery. Back with eleven clusters of minute dusky dots or points, close-set and forming as many dorsal saddles. Traces of as many, though slightly paler, alternate narrower saddle-like bars, also down back in intervening areas, though these not so distinct or extending so far down on sides. Orbital socket dusky.

Type, No. 3400, Bishop Museum, 30 mm. long. Taken November 5, 1922, at Laie Beach, Oahu, by Charles Montague Cooke 3rd, to whom the species is dedicated. Found in the sand scooped up just below the edge of the tidal wash. In life it is exceedingly difficult to detect, moving easily through the moist sand with which it harmonizes to a remarkable degree. This effect is heightened by its transparent or pellucid body, the pigment cells on the back showing both as dusky points and little silvery areas.

GADIDAE

Physiculus kaupi Poey.

LOPHOTIDAE

Lophotes capellei Schlegel.

Laysan Island.

